

# NON-DRUG APPROACHES TO CHRONIC PAIN

## WHAT IS THE DIFFERENCE BETWEEN ACUTE AND CHRONIC PAIN?

Acute pain is signaled through peripheral pain receptors at an anatomic site. As the site undergoes healing, the nociceptive receptors receive less stimulation, and activity decreases back to preinjury levels. Chronic pain often begins with the same nociceptive signals, but prolonged signaling results in changes to the nervous system. Neurons become hyperexcitable, and signals to the thalamus and cerebral cortex (where pain processing occurs) become amplified.[1] In addition, emotional and psychological changes that take place also color the pain experience.[1] The brain receives continued pain signals, even when there is no further tissue damage. This concept is at the core of what differentiates acute and chronic pain: when chronic, pain does not mean ongoing tissue damage.

## HOW IS PAIN TYPICALLY TREATED?

Conventional treatments of pain include ice, medications, interventional treatments, and sometimes surgery. Analgesic medications include acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), tramadol, and opioids. Adjunctive medications include tricyclic antidepressants and anticonvulsants. Collectively, these medications certainly have a role in treatment, but are limited in therapeutic success and have plentiful side effects.

## WHAT ARE SOME NON-DRUG TREATMENTS OF CHRONIC PAIN?

There are several classes of treatments other than pharmaceuticals that have the potential to help in pain. Exercise, nutrition, supplements, mind-body techniques, and modalities such as acupuncture and spinal manipulation all have evidence of benefit in pain disorders.

## DOES EXERCISE HELP CHRONIC PAIN?

Exercise can affect pain on multiple physiologic levels, making it an ideal treatment modality. Exercise can improve aerobic capacity, strength, and flexibility. This combination can lead to increased functional capacity over time. Exercise itself can alter pain perception, inducing hypoalgesia to new pain stimuli following both aerobic and strength training.[2] In individuals with chronic pain, this is best demonstrated at low- to moderate-intensity training.[2] Exercise is also known to have effects centrally, improving sleep and depressive symptoms.[3] These symptoms commonly coexist with chronic pain and impact pain perception, making them excellent targets for treatment. Overall, physical activity has been shown to have “few adverse events” and to “improve pain severity and physical function, and consequently quality of life”. (Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an

overview of Cochrane Reviews. Cochrane Database Syst Rev. 2017 Apr 24;4(4):CD011279. doi: 10.1002/14651858.CD011279.pub3. PMID: 28436583; PMCID: PMC5461882.)

## **ARE SOME EXERCISES PARTICULARLY GOOD FOR PEOPLE WITH CHRONIC PAIN?**

Overall, there is no “best” exercise program for patients with chronic pain. There is no evidence that one exercise program is superior to another. Because of this, it is most important to consider a patient’s current functional status and interests when making recommendations. Physical activity recommendations should be individualized.

(Fleckenstein J, Flössel P, Engel T, Krempel L, Stoll J, Behrens M, Niederer D. Individualized exercise in chronic non-specific low back pain: a systematic review with meta-analysis on the effects of exercise alone or in combination with psychological interventions on pain and disability. J Pain. 2022 Jul 29:S1526-5900(22)00364-9. doi: 10.1016/j.jpain.2022.07.005. Epub ahead of print. PMID: 35914641.) In addition, physical activity that is practiced long-term and consistently has been shown to yield the greatest improvement in chronic pain. (Borisovskaya A, Chmelik E, Karnik A. Exercise and Chronic Pain. Adv Exp Med Biol. 2020;1228:233-253. doi: 10.1007/978-981-15-1792-1\_16. PMID: 32342462.)

Yoga and tai chi are excellent exercises to consider for patients with chronic pain. Both can be done in a gentle manner and include important mind-body aspects, which can have added benefits. There are research studies showing positive outcomes with yoga as a treatment for chronic low back pain, rheumatoid arthritis, and chronic headaches.[4] Tai Chi and Qigong have been found to improve function in people with pain secondary to knee osteoarthritis, (Wen YR, Shi J, Wang YF, Lin YY, Hu ZY, Lin YT, Wang XQ, Wang YL. Are Mind-Body Exercise Beneficial for Treating Pain, Function, and Quality of Life in Middle-Aged and Old People With Chronic Pain? A Systematic Review and Meta-Analysis. Front Aging Neurosci. 2022 Jun 21;14:921069. doi: 10.3389/fnagi.2022.921069. PMID: 35800981; PMCID: PMC9255956.), improve the Fibromyalgia Impact Questionnaire in people with pain secondary to fibromyalgia (Vasileios P, Styliani P, Nifon G, Pavlos S, Aris F, Ioannis P. Managing fibromyalgia with complementary and alternative medical exercise: a systematic review and meta-analysis of clinical trials. Rheumatol Int. 2022 Jul 7. doi: 10.1007/s00296-022-05151-y. Epub ahead of print. PMID: 35796820.), improve pain associated with Parkinson’s Disease (Zhang YH, Hu HY, Xiong YC, Peng C, Hu L, Kong YZ, Wang YL, Guo JB, Bi S, Li TS, Ao LJ, Wang CH, Bai YL, Fang L, Ma C, Liao LR, Liu H, Zhu Y, Zhang ZJ, Liu CL, Fang GE, Wang XQ. Exercise for Neuropathic Pain: A Systematic Review and Expert Consensus. Front Med (Lausanne). 2021 Nov 24;8:756940. doi: 10.3389/fmed.2021.756940. PMID: 34901069; PMCID: PMC8654102.), improve disability and quality of life in those diagnosed with rheumatoid arthritis (Imoto AM, Amorim FF, Palma H, Lombardi Júnior I, Salomon AL, Peccin MS, Silva HECD, Franco ESB, Göttems L, Santana LA. Evidence for the efficacy of Tai Chi for treating rheumatoid arthritis: an overview of systematic reviews. Sao Paulo Med J. 2021 Mar-Apr;139(2):91-97. doi: 10.1590/1516-3180.2020.0346.R1.18112020. PMID: 33681883.), decrease low back pain, and minimally improved pain associated with the neuropathic pain of multiple sclerosis (Urits I, Schwartz RH, Orhurhu V, Maganty NV, Reilly BT, Patel PM, Wie C, Kaye AD, Mancuso KF, Kaye AJ, Viswanath O. A Comprehensive Review of Alternative Therapies for the Management of Chronic Pain Patients: Acupuncture, Tai Chi, Osteopathic Manipulative

Medicine, and Chiropractic Care. Adv Ther. 2021 Jan;38(1):76-89. doi: 10.1007/s12325-020-01554-0. Epub 2020 Nov 12. PMID: 33184777; PMCID: PMC7854390.)

Of note, there is evidence to suggest that VA-hosted telemedicine facilitation of complementary and integrative health related movement therapies such as tai chi and yoga are effective for chronic pain as well. (Mullur RS, Kaur Cheema SP, Alano RE, Chang LE. Tele-Integrative Medicine to Support Rehabilitative Care. Phys Med Rehabil Clin N Am. 2021 May;32(2):393-403. doi: 10.1016/j.pmr.2020.12.006. Epub 2021 Feb 5. PMID: 33814064.)

## CAN NUTRITION HELP WITH PAIN?

Nutritional choices can influence pain directly or indirectly. Some foods have known anti-inflammatory properties, which may affect pain through altering cytokine and oxidant production.[5] Indirectly, food can affect pain through improving mood, energy level, and sleep, as well as by helping a person achieve a healthy weight. The Mediterranean diet offers many of the anti-inflammatory components offered above in addition to having research supporting cardiovascular health benefits. This diet emphasizes fruits, vegetables, whole grains, olive oil, and nuts while limiting the intake of meat and dairy products. A trial of a Mediterranean-style diet, provided a person can tolerate the grains included, is reasonable for most chronic pain patients as a means of attempting to improve multiple health measures, including pain. A 2022 systematic review of 24 studies revealed that a diet modified to a hypocaloric, Mediterranean or a healthier profile in general can significantly improve chronic non-cancer pain. (Xu Lou I, Gil-García E, Cáceres-Matos R, Ali K, Molina E. Nutritional aspects in chronic non-cancer pain: A systematic review. Front Nutr. 2022 Aug 8;9:931090. doi: 10.3389/fnut.2022.931090. PMID: 36003834; PMCID: PMC9393325.) Processed foods should be minimized, and whole foods should be emphasized, regardless of the specific diet a person chooses to follow. A 2021 review showed an association between incorporating foods containing anti-inflammatory nutrients such as fruits, vegetables, long chain and monounsaturated fats, antioxidants and fiber and a reduction in pain severity and interference. (Brain K, Burrows TL, Bruggink L, Malfliet A, Hayes C, Hodson FJ, Collins CE. Diet and Chronic Non-Cancer Pain: The State of the Art and Future Directions. J Clin Med. 2021 Nov 8;10(21):5203. doi: 10.3390/jcm10215203. PMID: 34768723; PMCID: PMC8584994.)

## WHAT SUPPLEMENTS CAN HELP WITH CHRONIC PAIN?

**Note:** Please see the [Passport to Whole Health](#), Chapter 15 on Dietary Supplements for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

## OMEGA-3 SUPPLEMENTATION

There is more research supporting the use of omega-3 fatty acids with overt inflammatory conditions. For instance, omega-3 supplementation has been found to improve joint tenderness and morning stiffness in rheumatoid arthritis.[6] (Raad T, Griffin A, George ES, Larkin L, Fraser A, Kennedy N, Tierney AC. Dietary Interventions with or without Omega-3 Supplementation for the Management of Rheumatoid Arthritis: A Systematic Review. *Nutrients*. 2021 Oct 4;13(10):3506. doi: 10.3390/nu13103506. PMID: 34684507; PMCID: PMC8540415.) Doses should be standardized based on the amount of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) present in the supplement; it should exceed 2 gms per day of EPA plus DHA to get the desired benefit. Omega-3 supplements are quite safe and may improve other aspects of health, such as lipid profiles.

## **VITAMIN D**

There is a high correlation between vitamin D deficiency and chronic pain, based on epidemiologic data.[7] It is not clear, however, if there is a causal relationship. A 2022 systematic review of 14 studies showed a correlation between vitamin D deficiency and chronic pain. In addition, 6 studies showed improved pain with Vitamin D supplementation in people with vitamin D deficiency. Eight studies showed that there may be pain reduction, regardless of vitamin D deficiency. Of note, a 2013 study specific to Veterans found that vitamin D improved pain, sleep, and quality-of-life measure in patients with chronic pain.[9] At this time, supplementation seems reasonable in those patients with low vitamin D levels, and empirical vitamin D supplementation for pain alone is supported by some evidence. (Lombardo M, Feraco A, Ottaviani M, Rizzo G, Camajani E, Caprio M, Armani A. The Efficacy of Vitamin D Supplementation in the Treatment of Fibromyalgia Syndrome and Chronic Musculoskeletal Pain. *Nutrients*. 2022 Jul 22;14(15):3010. doi: 10.3390/nu14153010. PMID: 35893864; PMCID: PMC9330000.)

## **MAGNESIUM**

Magnesium deficiency appears to be more common in patients with fibromyalgia, and deficiency is correlated with fibromyalgia symptoms. Supplementation with magnesium citrate has been shown to reduce the intensity of fibromyalgia symptoms.[10] Several clinical studies have found that Mg has beneficial effects in patients suffering from neuropathic pain, dysmenorrhea, tension headache, acute migraine attack, and others. These effects are considered to be due to blockade of the NMDA receptor, attenuation of central sensitization, and muscle relaxing effects. (Marchesi N, Govoni S, Allegri M. Non-drug pain relievers active on non-opioid pain mechanisms. *Pain Pract*. 2022 Feb;22(2):255-275. doi: 10.1111/papr.13073. Epub 2021 Sep 18. PMID: 34498362.) Magnesium supplements can be calming for some patients, so it can be useful to take them before bed. A dose of 400-800 mgs of a magnesium supplement is often recommended. Magnesium oxide should be avoided as a supplement due to its laxative effects. Dietary sources of magnesium include whole grains, spinach, almonds, soybeans, and avocados.

## **OTHERS TO CONSIDER**

Research has suggested that several other dietary supplements may also have benefits in the setting of chronic pain. While further study is necessary, the strongest evidence for these supplements are as follows:

Supplements	Role	Indications	Suggested Dose When Treating Pain
Vitamin B complex	vitamin supplementation	Neuropathic pain, knee osteoarthritis, diabetic neuropathy	use Reference Daily Intake (RDI)
Alpha Lipoic Acid	antioxidant, anti-inflammatory	Diabetic neuropathy, headache, carpal tunnel syndrome, burning mouth syndrome, rheumatoid arthritis, chronic pain	600-1000mg daily
Acetyl L Carnitine	antioxidant, modulates brain neurotransmitters including dopamine and serotonin	diabetic neuropathy, carpal tunnel syndrome	500mg twice daily
Coenzyme Q10 (ubiquinone)	anti-inflammatory, antioxidant	fibromyalgia, rheumatoid arthritis, migraines	30-100mg daily

Marchesi N, Govoni S, Allegri M. Non-drug pain relievers active on non-opioid pain mechanisms. *Pain Pract.* 2022 Feb;22(2):255-275. doi: 10.1111/papr.13073. Epub 2021 Sep 18. PMID: 34498362.

Karaganis S, Song XJ. B vitamins as a treatment for diabetic pain and neuropathy. *J Clin Pharm Ther.* 2021 Oct;46(5):1199-1212. doi: 10.1111/jcpt.13375. Epub 2021 Feb 9. PMID: 33565138.

Cassanego G, Rodrigues P, De Freitas Bauermann L, Trevisan G. Evaluation of the analgesic effect of  $\alpha$ -lipoic acid in treating pain disorders: A systematic review and meta-analysis of

randomized controlled trials. *Pharmacol Res.* 2022 Mar;177:106075. doi: 10.1016/j.phrs.2022.106075. Epub 2022 Jan 10. PMID: 35026405.

Sarzi-Puttini P, Giorgi V, Di Lascio S, Fornasari D. Acetyl-L-carnitine in chronic pain: A narrative review. *Pharmacol Res.* 2021 Nov;173:105874. doi: 10.1016/j.phrs.2021.105874. Epub 2021 Sep 7. PMID: 34500063.

A number of botanical **supplements** are also important for clinicians to be aware of:

### **DEVIL'S CLAW (HARPAGOPHYTUM PROCUMBENS)**

A 2007 “meta-review” included five systematic reviews on devil’s claw with strong evidence of effectiveness for low back pain and osteoarthritis (OA) pain of the knee and hip.[11] This effect was *not* inferior to NSAIDs. The review concluded by stating, “Since there is strong evidence for devil’s claw...the possible place in the treatment schedule before NSAIDs should be considered.”[11] Doses should be at least 50 mgs of the harpagoside, which equates to 2.6 gms/day of the root. Effects are dose dependent. It is generally well tolerated.

### **WILLOW BARK (SALIX ALBA)**

Willow bark is an herb containing salicin, which is related to aspirin. It has been used for centuries to relieve pain.[12] The mechanism of action is thought to be COX-2 inhibition similar to aspirin, without the effects on prostaglandins or coagulation. There is evidence of efficacy in chronic low back similar to that seen in rofecoxib 12.5 mgs.[12] Evidence in osteoarthritis is mixed.[12] The effect is dose dependent, and the willow bark dosage used in studies was standardized to 240 mgs of salicin.

### **TOPICAL CAPSAICIN**

Capsaicin is widely available a cream in various doses. It is useful as a short-term analgesic, and a review has shown this superior to placebo for acute episodes of chronic low back pain.[13] A 2016 Cochrane review confirmed *Capsicum frutescens* as superior to placebo in the treatment of pain. (Gagnier JJ, Oltean H, van Tulder MW, Berman BM, Bombardier C, Robbins CB. Herbal Medicine for Low Back Pain: A Cochrane Review. *Spine* (Phila Pa 1976). 2016 Jan;41(2):116-33. doi: 10.1097/BRS.0000000000001310. PMID: 26630428.)

### **TURMERIC (CURCUMIN)**

*Curcuma longa* L. is a plant of the Zingiberaceae family, native to south-eastern Asia, rich in bioactive molecules with numerous health and therapeutic benefits. Its anti-inflammatory effects seem to play a role in the mitigation of pain. Curcumin, which is the most represented component in turmeric extracts, also has antioxidant activity comparable to that of vitamin C and vitamin E. Studies have shown analgesic effects in the setting of osteoarthritis, chronic postsurgical pain, and active rheumatoid arthritis. (Marchesi N,



Govoni S, Allegri M. Non-drug pain relievers active on non-opioid pain mechanisms. *Pain Pract.* 2022 Feb;22(2):255-275. doi: 10.1111/papr.13073. Epub 2021 Sep 18. PMID: 34498362; Bagherniya M, Darand M, Askari G, Guest PC, Sathyapalan T, Sahebkar A. The Clinical Use of Curcumin for the Treatment of Rheumatoid Arthritis: A Systematic Review of Clinical Trials. *Adv Exp Med Biol.* 2021;1291:251-263. doi: 10.1007/978-3-030-56153-6\_15. PMID: 34331695.) Turmeric is most often used at doses of 1500mg daily and has been studied at this dose for up to three months. Extracts typically include piperine, an active constituent of pepper, to improve turmeric bioavailability. This botanical medicine is generally well tolerated with most common side effects being Constipation, dyspepsia, diarrhea, distension, gastroesophageal reflux, nausea, and vomiting. (Natural Standard Database, Turmeric, Date Accessed 8/31/22)

## **BOSWELLIA**

*Boswellia serrata* or incense tree is an arboreal plant prevalent in the Maghreb region, in Southeast Asia, and in India. (Marchesi N, Govoni S, Allegri M. Non-drug pain relievers active on non-opioid pain mechanisms. *Pain Pract.* 2022 Feb;22(2):255-275. doi: 10.1111/papr.13073. Epub 2021 Sep 18. PMID: 34498362.) The most convincing evidence for *Boswellia*'s use in chronic pain at this point in time is for osteoarthritis. A 2020 meta-analysis of small, low-quality randomized controlled trial concluded that *Boswellia serrata* extract 100-250mg daily for 1-3 months moderately reduces pain and improves function when compared with placebo. (Yu G, Xiang W, Zhang T, Zeng L, Yang K, Li J. Effectiveness of *Boswellia* and *Boswellia* extract for osteoarthritis patients: a systematic review and meta-analysis. *BMC Complement Med Ther.* 2020;20(1):225.) *Boswellia* is generally well tolerated, with most common side effects including abdominal pain, diarrhea, heartburn, itching, nausea. (Natural Standard Database, *Boswellia serrata*, date accessed 8/31/22)

## **ARE MIND-BODY APPROACHES USEFUL IN PAIN?**

The link between mind-body interventions and chronic pain is important to consider, given the adaptive changes of the central nervous system that occur in chronic pain. Using mind-body interventions directly addresses this component of central-mediated pain.[14] Mind-body interventions not only improve pain, but also mood-related symptoms, stress management, and illness-related coping skills.

Mind-body interventions have been evaluated for their use in OA, rheumatoid arthritis, chronic low back pain, chronic headache, fibromyalgia, and post-surgical pain, among many others.[15] A Cochrane review on behavioral therapies in chronic low back pain concluded that strong evidence exists for a moderate effect on pain relief and mild improvement in functional status and behavioral outcomes with behavioral therapies.[16] Similar results were found for RA in a meta-analysis of studies that focused on psychological-behavioral interventions and their ability to improve pain, disability, psychological status, and coping.[15] The current evidence in fibromyalgia is currently less robust, with limited evidence of benefit when behavioral treatments are used in isolation.[17] However, there is moderate evidence of effectiveness when they are combined with aerobic exercise.[15]

More general chronic pain (not linked to another diagnosis) also seems to be effectively treated with mind-body therapies. (Oliveira I, Garrido MV, Bernardes SF. On the body-mind nexus in chronic musculoskeletal pain: A scoping review. *Eur J Pain*. 2022 Jul;26(6):1186-1202. doi: 10.1002/ejp.1944. Epub 2022 Apr 4. PMID: 35315163.) A meta-analysis found cognitive behavioral therapy in chronic pain to be effective for improving pain intensity, coping skills, activity level, and social function.[18] In 2022, systematic reviews of clinical hypnosis (Langlois P, Perrochon A, David R, Rainville P, Wood C, Vanhaudenhuyse A, Pageaux B, Ounajim A, Lavallière M, Debarnot U, Luque-Moreno C, Roulaud M, Simoneau M, Goudman L, Moens M, Rigoard P, Billot M. Hypnosis to manage musculoskeletal and neuropathic chronic pain: A systematic review and meta-analysis. *Neurosci Biobehav Rev*. 2022 Apr;135:104591. doi: 10.1016/j.neubiorev.2022.104591. Epub 2022 Feb 19. PMID: 35192910.; McKittrick ML, Connors EL, McKernan LC. Hypnosis for Chronic Neuropathic Pain: A Scoping Review. *Pain Med*. 2022 May 4;23(5):1015-1026. doi: 10.1093/pm/pnab320. PMID: 34718772.), neurobiofeedback (Hesam-Shariati N, Chang WJ, Weweg MA, McAuley JH, Booth A, Trost Z, Lin CT, Newton-John T, Gustin SM. The analgesic effect of electroencephalographic neurofeedback for people with chronic pain: A systematic review and meta-analysis. *Eur J Neurol*. 2022 Mar;29(3):921-936. doi: 10.1111/ene.15189. Epub 2021 Dec 10. PMID: 34813662.) and heart rate variability biofeedback (Fournié C, Chouchou F, Dalleau G, Caderby T, Cabrera Q, Verkindt C. Heart rate variability biofeedback in chronic disease management: A systematic review. *Complement Ther Med*. 2021 Aug;60:102750. doi: 10.1016/j.ctim.2021.102750. Epub 2021 Jun 10. PMID: 34118390.) have demonstrated the positive effect of these practices in chronic musculoskeletal and neuropathic pain.

Broadly speaking, mind-body therapies have shown promise in decreasing pain and improving function with many diagnoses.[15] What is not known, however, is which specific interventions provide the most benefit. Most mind-body interventions seem effective. The best choice for individual patients will depend on what is available in their VA facility or in their local area, as well as which therapies resonate most with a given patient. For more information about mind-body approaches and specific tools that might be of use, refer to the “[Power of the Mind](#)” overview and related tools.

## **WHAT ARE SOME HANDS-ON MODALITIES THAT MAY BE USEFUL IN TREATING CHRONIC PAIN?**

Manual therapies such as osteopathic manipulation, chiropractic manipulation, massage therapy, acupuncture, and prolotherapy are examples of adjunctive modalities that are useful in different types of chronic pain.



## IS MANIPULATION HELPFUL?

Osteopathic and chiropractic manipulation treatments are readily available and commonly used modalities in treating musculoskeletal pain. Spinal manipulative therapy has been evaluated by multiple clinical trials and several systematic reviews. Manipulation treatments appear to be most helpful in the treatment of low back pain. A 2005 systematic review and a 2011 Cochrane review both found evidence of improved pain control in patients with chronic low back pain who received spinal manipulation.[19,20] The National Institute for Health and Care Excellence (NICE) guidelines on treatment of persistent low back pain also include manipulation as one of the initial modalities of choice.[21] A 2022 meta-analysis on spinal manipulation in adults between 65 and 91 suggested that manipulation should be considered an effective treatment for chronic low back pain in this population. (Jenks A, de Zoete A, van Tulder M, Rubinstein SM; International IPD-SMT group. Spinal manipulative therapy in older adults with chronic low back pain: an individual participant data meta-analysis. *Eur Spine J.* 2022 Jul;31(7):1821-1845. doi: 10.1007/s00586-022-07210-1. Epub 2022 May 28. PMID: 35633383.)

Spinal manipulation is commonly used for pain conditions other than chronic low back pain, although the evidence supporting its use is less conclusive. Preliminary results from a 2019 systematic review of spinal manipulation for migraine pain and disability suggest that manipulation may be an effective therapeutic intervention (Rist PM, Hernandez A, Bernstein C, Kowalski M, Osypiuk K, Vining R, Long CR, Goertz C, Song R, Wayne PM. The Impact of Spinal Manipulation on Migraine Pain and Disability: A Systematic Review and Meta-Analysis. *Headache.* 2019 Apr;59(4):532-542. doi: 10.1111/head.13501. Epub 2019 Mar 14. PMID: 30973196; PMCID: PMC6461372.). There is inconclusive evidence for manipulation in the treatment of temporomandibular joint dysfunction. [22] Currently, systematic reviews do not support the use of spinal manipulation for the treatment of chronic neck pain or fibromyalgia.[23,24] For additional information, refer to the section on Osteopathy in Chapter 16 of the [Passport to Whole Health](#).

## IS MASSAGE HELPFUL?

Massage therapy is commonly used for both relaxation purposes and as a therapeutic modality for pain. A 2008 review concluded that strong evidence exists that massage is effective for nonspecific chronic low back pain.[25] Interestingly, effects of massage can be long-lasting, with improvements shown at 1-year follow-up.[25] There is also evidence of benefit of massage therapy in patients with fibromyalgia.[26] A 2019 review confirmed that massage is effective in chronic pain conditions to improve pain and function, specifically for chronic low back pain and fibromyalgia. (Skelly AC, Chou R, Dettori JR, Turner JA, Friedly JL, Rundell SD, Fu R, Brodt ED, Wasson N, Winter C, Ferguson AJR. Noninvasive Nonpharmacological Treatment for Chronic Pain: A Systematic Review [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2018 Jun. Report No.: 18-EHC013-EF. PMID: 30179389.) A 2021 review assessed that manual therapy may also benefit people suffering from chronic tension-type headaches. (Turkistani A, Shah A, Jose AM, Melo JP, Luenam K, Ananias P, Yaqub S, Mohammed L. Effectiveness of Manual Therapy and Acupuncture in Tension-Type Headache: A Systematic

Review. Cureus. 2021 Aug 31;13(8):e17601. doi: 10.7759/cureus.17601. PMID: 34646653; PMCID: PMC8483450.) A 2022 review demonstrated that manual soft tissue therapy is effective at alleviating chronic neck pain. Massage therapy is safe, although care needs to be taken in patients with a trauma history or hypersensitivity to not cause a flare of pain with more aggressive soft tissue treatments. For more information, refer to the section on Massage in Chapter 16 of the [Passport to Whole Health](#).

## WHAT IS ACUPUNCTURE? IS IT EFFECTIVE FOR PAIN?

Acupuncture is one of several elements of traditional Chinese medicine (TCM), and it has a history of more than 2,000 years of use. TCM is a holistic system encompassing acupuncture, herbal medicine, nutrition, meditative practices (qi gong), and movement (tai chi). TCM is based on the belief that health is maintained by balancing two opposing forces, yin and yang. Yin is the cold, slow, or passive force, and yang represents the hot, excited, or active force.[27] Yin and yang balance is managed by qi, the body's vital energy source, believed to flow in channels throughout the body. Disease results from an imbalance of yin and yang with resultant blockages in the free flow of qi. The goal of TCM modalities is to restore and maintain the balance of yin and yang. Acupuncture stimulates points on the body, usually with needles, altering the flow of qi attempting to achieve this balance. Even though acupuncture represents one piece of TCM, it is often practiced as an independent therapy. For additional information, refer to the section on Chinese Medicine and Acupuncture in Chapter 18 of the [Passport to Whole Health](#).

While the World Health Organization lists over 40 disorders effectively treated with acupuncture, pain is the common reason acupuncture is used.[28] There is a growing literature base and multiple reviews in support of using acupuncture for these multiple indications. From 1991 to 2009 nearly 4,000 acupuncture research studies were published, and pain was the focus of 41% of them.[28] Cochrane reviews showing the effectiveness of acupuncture have been published for neck pain, low back pain, headaches, and osteoarthritis.[29] Several other literature reviews support the use of acupuncture in the treatment of chronic low back pain. (Asano H, Plonka D, Weeger J. Effectiveness of Acupuncture for Nonspecific Chronic Low Back Pain: A Systematic Review and Meta-Analysis. Med Acupunct. 2022 Apr 1;34(2):96-106. doi: 10.1089/acu.2021.0057. Epub 2022 Apr 19. PMID: 35509875; PMCID: PMC9057891.) The NICE low back pain treatment guidelines list acupuncture as a primary therapeutic option.[30-32] The Cochrane summary on the use of acupuncture in migraines concludes that “acupuncture is at least as effective, and possibly more effective, than prophylactic drug treatment and has fewer adverse effects.”[33] And there is a growing literature base that supports the use of acupuncture in fibromyalgia treatment. (Berger AA, Liu Y, Nguyen J, Spraggins R, Reed DS, Lee C, Hasoon J, Kaye AD. Efficacy of acupuncture in the treatment of fibromyalgia. Orthop Rev (Pavia). 2021 Jun 22;13(2):25085. doi: 10.52965/001c.25085. PMID: 34745475; PMCID: PMC8567806.)

Overall, acupuncture is an appealing therapeutic modality for the treatment of chronic pain. It has evidence of benefit in several common pain syndromes and can also help address some of the common coexisting symptoms, such as sleep problems.[34] Acupuncture is quite safe and normally well tolerated. With the growing use of the protocolized auricular Battlefield Acupuncture (BFA) to treat pain in the VA, it is important to mention that at this point reviews of some low-quality studies have shown an association between BFA treatment and improved pain. More study is warranted. (Yang J, Ganesh R, Wu Q, Li L, Ogletree SP, Del Fabro AS, Wahner-Roedler DL, Xiong D, Bauer BA, Chon TY. Battlefield Acupuncture for Adult Pain: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Am J Chin Med*. 2021;49(1):25-40. doi: 10.1142/S0192415X21500026. Epub 2020 Dec 29. PMID: 33375924, Salamone FJ, Federman DG. Battlefield Acupuncture as a Treatment for Pain. *South Med J*. 2021 Apr;114(4):239-245. doi: 10.14423/SMJ.0000000000001232. PMID: 33787939.)

## WHAT IS PROLOTHERAPY?

Prolotherapy is an injection therapy for painful ligaments, tendons, and joints. The goal of the treatment is to induce an inflammatory response in the affected tissues, and thereby stimulate the body's natural healing response. The most common injection is a combination of lidocaine and dextrose (sugar water). Newer variations of prolotherapy include injections of a patient's own plasma, known as platelet-rich plasma (PRP), or injection of stem cells. All of these injection types are intended to relieve pain by strengthening soft tissue structures.

Some of the best research on the efficacy of prolotherapy is in the treatment of knee OA pain. A randomized controlled trial published in 2013 demonstrated that three to five prolotherapy injections improved pain and function more than exercise. Improvements were sustained at one-year follow up.[35]

Prolotherapy can be considered for more localized pain syndromes in which tendons or ligamentous structures are pain generators. Other examples include lateral epicondylitis, Achilles tendinosis, or plantar fasciitis (Chutumstid T, Susantitaphong P, Koonalinthip N. Effectiveness of dextrose prolotherapy for the treatment of chronic plantar fasciitis: A systematic review and meta-analysis of randomized controlled trials. *PM R*. 2022 Mar 25. doi: 10.1002/pmrj.12807. Epub ahead of print. PMID: 35338597.) More recent research also suggests benefit in treating chronic low back pain. (Giordano L, Murrell WD, Maffulli N. Prolotherapy for chronic low back pain: a review of literature. *Br Med Bull*. 2021 Jun 10;138(1):96-111. doi: 10.1093/bmb/ldab004. PMID: 33884404.) and chronic musculoskeletal pain (Bae G, Kim S, Lee S, Lee WY, Lim Y. Prolotherapy for the patients with chronic musculoskeletal pain: systematic review and meta-analysis. *Anesth Pain Med* (Seoul). 2021 Jan;16(1):81-95. doi: 10.17085/apm.20078. Epub 2020 Dec 16. PMID: 33348947; PMCID: PMC7861898.). The main drawbacks of prolotherapy are post-injection soreness and the cost, as this is typically not a benefit covered by insurance or widely available within the VA.

## RESOURCE LINKS

- [Passport to Whole Health](https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf):  
[https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport\\_to\\_WholeHealth\\_FY2020\\_508.pdf](https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf)
- [Power of the Mind](https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/power-of-the-mind.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/power-of-the-mind.asp>

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*This Whole Health tool was made possible through a collaborative effort between the University of Wisconsin Integrative Health Program, VA Office of Patient Centered Care and Cultural Transformation, and Pacific Institute for Research and Evaluation.*

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